C Programming Exam: Beginner Level
Topics Covered:

1. Functions
2. Arrays
3. Structures
4. File Handling
5. Strings

Total Marks: 100
Duration: 2 Hours

Section A: Multiple Choice Questions (15 Marks)

Each question carries 2 marks. Choose the correct option.

1. **Which of the following is the correct syntax to declare a function in C?**
    - a) `int functionName();`
    - b) `functionName();`
    - c) `void functionName[];`
    - d) `functionName(int x);`
2. **What is the index of the first element in an array in C?**
    - a) 1
    - b) 0
    - c) -1
    - d) None of the above
3. **Which of the following is used to read a string from the user in C?**
    - a) `scanf()`
    - b) `gets()`
    - c) `fgets()`
    - d) All of the above
4. **A structure in C is used to:**
    - a) Store similar data types
    - b) Store different data types
    - c) Perform arithmetic operations
    - d) None of the above
5. **Which function is used to close a file in C?**
    - a) `fstop()`
    - b) `fend()`
    - c) `fclose()`
    - d) `closefile()`
6. **What is the output of the following code?**

```
int arr[] = {10, 20, 30, 40};
printf("%d", arr[2]);
```

- a) 10
- b) 20
- c) 30
- d) 40

7. **Which operator is used to access members of a structure?**
    - a) . (Dot operator)
    - b) -> (Arrow operator)
    - c) & (Address operator)
    - d) * (Dereference operator)
8. **Which of the following is a correct way to declare a string in C?**
    - a) `char str[] = "Hello";`
    - b) `string str = "Hello";`
    - c) `char str[5] = 'Hello';`
    - d) `str = "Hello";`
9. **Which of the following is NOT a file mode in C?**
    - a) `r`
    - b) `w`
    - c) `x`
    - d) `a`
10. **Which function is used to read data from a file in C?**

- a) `fscan()`
- b) `fgets()`
- c) `fread()`
- d) `fget()`

11. **Which of the following is true about function prototypes in C?**

- a) They are mandatory for every function
- b) They provide the compiler with function details before its definition
- c) They define the body of the function
- d) They cannot have default parameters

12. **What happens if an array is accessed out of its bounds?**

- a) Compilation error
- b) Array is resized automatically
- c) Undefined behavior
- d) The last element of the array is returned

13. **Which library function is used to compare two strings?**

- a) `strcmp()`
- b) `strcat()`
- c) `strcpy()`
- d) `strlength()`

14. **In file handling, the mode "a+" is used for:**

- a) Reading and writing at the start of the file
- b) Appending and reading from the end of the file
- c) Only writing to a new file
- d) Only reading from an existing file

15. **What is the size of an integer in C?**

- a) 4 bytes
- b) 1 byte
- c) Compiler dependent
- d) Not allowed in C

Section B: Short Answer Questions (16 Marks)

Each question carries 2 marks. Answer in 3-4 sentences.

1. Explain the difference between call by value and call by reference in functions.
2. How are strings stored in C? How does it differ from character arrays?
3. What is the purpose of `struct` in C? Give an example.
4. Explain how to open a file in read and write mode in C.
5. What are multidimensional arrays? Provide a small example.
6. What is the use of the `fscanf()` and `fprintf()` functions?
7. Describe the process of passing arrays to functions.
8. How does the `strcpy()` function work? What are its limitations?

Section C: Code Analysis (15 Marks)

Each question carries 5 marks. Analyze the given code and answer the questions.

1. Functions and Arrays

```
#include <stdio.h>
void modifyArray(int arr[], int size) {
    for (int i = 0; i < size; i++) {
        arr[i] = arr[i] * 2;
    }
}
int main() {
    int numbers[] = {1, 2, 3, 4, 5};
    modifyArray(numbers, 5);
    for (int i = 0; i < 5; i++) {
        printf("%d ", numbers[i]);
    }
    return 0;
}
```

- What is the output of the above code? Explain why.
- How is the array being passed to the function?

2. Structures and Strings

```
#include <stdio.h>
#include <string.h>
struct Student {
    char name[50];
    int age;
};
int main() {
    struct Student s1;
    strcpy(s1.name, "Alice");
    s1.age = 20;
    printf("Name: %s, Age: %d\n", s1.name, s1.age);
    return 0;
}
```

- **What does this code print?**
- **How is the string being assigned to the structure member?**
  Hint: Explain the use of `strcpy()` for string assignment.

3. File Handling

```
#include <stdio.h>
int main() {
    FILE *fp;
    fp = fopen("data.txt", "r");
    char ch;
    while ((ch = fgetc(fp)) != EOF) {
        printf("%c", ch);
    }
    fclose(fp);
    return 0;
}
```

- What does this program do?
- What would happen if the file does not exist?

Section D: Programming Questions (20 Marks)

Each question carries 5 marks. Write complete programs with proper syntax and comments.

1. **File Handling and Structures**
   - Write a program to read employee details (Name, ID, Salary) from a file and display them.
2. **String Manipulation and Functions**
   - Write a program that accepts a string and counts the number of vowels, consonants, digits, and special characters.
3. **Array Operations**
   - Write a program to find the maximum and minimum elements in an array using functions.
4. **Structure and Array Combination**
   - Create a student management system using structures and arrays to store and display student details (Name, Roll Number, Marks).

Section E: Debugging (10 Marks)

Identify and correct the errors in the following code snippets:

1. Array Out-of-Bounds Error

```
#include <stdio.h>
int main() {
    int arr[5] = {1, 2, 3, 4, 5};
    for (int i = 0; i <= 5; i++) {
        printf("%d ", arr[i]);
    }
    return 0;
}
```

- *Hint: Array indexing starts from 0. Avoid accessing out of bounds.*

2. Pointer Errors

```
#include <stdio.h>
int main() {
    int *p;
    *p = 10;
    printf("%d", *p);
    return 0;
}
```

- *Hint: Initialize pointers before dereferencing to avoid undefined behavior.*

3. File Handling Mistakes

```
#include <stdio.h>
int main() {
    FILE *fp;
    fp = fopen("data.txt", "w");
    fputs("Hello, World!", fp);
    printf("File written successfully");
    return 0;
}
```

- *Hint: Always close the file after writing.*

Section F: Real-World Problem Solving and Application (15 Marks)

Each question carries 15 marks.

- **E-Commerce Order Processing:**
  - A small e-commerce website needs a system to process customer orders.
    - Customers place orders with details: `Order ID`, `Customer Name`, `Product`, `Quantity`, `Price`, and `Status (Pending, Shipped, Delivered)`.
    - Orders should be stored in a file named "orders.txt".

Hint: Utilize structures and file handling for data persistence.
